

240



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/692,923	10/20/2000	Francisco Hideki Imai	1819/100111	8475

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EXAMINER

HENN, TIMOTHY J

ART UNIT

PAPER NUMBER

2612

DATE MAILED: 01/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/692,923

Applicant(s)

IMAI ET AL.

Examiner

Timothy J Henn

Art Unit

2612

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 September 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-70 is/are pending in the application.
- 4a) Of the above claim(s) 23-36 and 51-70 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 and 37-50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/22/01.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 1-22 and 37-50 in the reply filed on 16 September 2004 is acknowledged. The traversal is on the ground(s) that the claims require common areas of search and consideration. This is not found persuasive because the search for Group I does not require searching for two or more image acquisition systems as is required in the search for Group II and also does not require searching for the specifics of estimating spectral reflectances as is required for Group III.

The requirement is still deemed proper and is therefore made FINAL.

Claim Objections

2. Claims 3, 10, 14 and 22 objected to because of the following informalities: These claims contain the limitation "the set of color filters", however this limitation does not appear in claims 1, 12 and 22 from which claims 3, 10, 14 and 22 depend. For the purposes of art rejection this limitation will be read as "the set of filters". The examiner notes that in the event that claims 10 and 22 are amended to state that the set of filters correspond to the set of non-interference filters of claims 1 and 12, claims 10 and 22 would then be non-limiting as claims 1 and 12 already require the use of "non-interference" filters. Appropriate correction is required.

Claim Rejections - 35 USC § 103

Art Unit: 2612

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohyama et al. (US 5,864,364) in view of Handschy et al. (US 5,347,378).

[claim 12]

Regarding claim 12, Ohyama discloses an apparatus for multi-spectral image capture comprising: one image acquisition system having two or more color channels (Figure 4), each of the channels having a different spectral sensitivity (Figure 7A), the image acquisition system acquiring a first series of images of the first scene (Figure 7B; c. 7, ll. 48-50; c. 9, ll. 54-65) and a set of filters (Figure 4, Item 2), each of the filters having a different spectral transmittance (Figure 7A) and being positioned between the scene and the image acquisition system (Figure 4), the filters filtering a different image in series of images (Figure 7B; c. 9, ll. 54-65). However, Ohyama does not disclose filters which are non-interference filters.

Handschy discloses a selective filter apparatus (e.g. Figure 1) for use in camera systems (Figure 6a). The selective filter of Handschy can be of either absorption (i.e. non-interference) or interference type (c. 4, ll. 63-66; c. 17, ll. 50-59) and have faster switching response times than mechanical color wheel filter systems (c. 1, l. 39 - c. , l. 2; c. 4, ll. 54-66). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the filter of Handschy in the multi-spectral

Art Unit: 2612

image capture system of Ohyama to allow for faster image capture due to faster filter switching times. Since Handschy discloses that either absorption (i.e. non-interference) or interference filters can be used to provide the same results, it further would have been obvious to one of ordinary skill in the art at the time the invention was made to choose the absorption filter disclosed over the interference filter disclosed as a recognized art equivalent.

[claim 13]

Regarding claim 13, Ohyama discloses a spectral image processing system which generates a multi-spectral scene description from the acquired first series of filtered images (c. 10, ll. 41-51).

[claim 14]

Regarding claim 14, Ohyama disclose an image acquisition system which acquires a second series of images of a second scene and the set of filters filter each of the second series of images of the second scene with a different filter (c. 9, ll. 5-11).

[claim 15]

Regarding claim 15, Ohyama discloses generating a characteristic mapping from the second series of filtered images (c. 11, ll. 12-37; Figure 13, " $L(\lambda)$ ").

[claim 16]

Regarding claim 16, Ohyama discloses generating a spectral reflectance (Figure 13, " $S(\lambda)$ ") of the first scene from the multi-spectral scene description (Figure 13, " $S(\lambda)L(\lambda)$ ") and the characteristic mapping (Figure 13, " $L(\lambda)$ ").

[claim 17]

Art Unit: 2612

Regarding claim 17, Ohyama discloses a reproduction device to display the first scene based on the spectral reflectance (e.g. Figure 1, "REPRODUCTION SIDE"), but does not disclose a printing device to do so. Official Notice is taken that it is notoriously well known to print images using printing devices so as to create a hard copy of the image. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a printing device on the reproduction side of Ohyama in view of Handschy to create hard copies of the reproduced first scene.

[claim 18]

Regarding claim 18, Ohyama does not explicitly disclose a memory device for storing the generated spectral reflectance for the first scene. However, it is noted that this value is created in a divider (Figure 13, Item 352) and then sent to an adder (Figure 13, Item 353). It is noted that the spectral reflectance must inherently be stored after its creation so that it may be used for further processing (i.e. by the adder) in the arithmetic unit of Ohyama.

[claim 21]

Regarding claim 21, Ohyama in view of Handschy discloses the use of non-interference filters (see claim 1).

[claim 22]

Regarding claim 22, Handschy discloses the use of absorption filters (c. 5, ll. 5-27).

[claims 1-7, 10 and 11]

Claims 1-7, 10 and 11 are method claims corresponding to apparatus claims 12-18, 21 and 22. Therefore, claims 1-7, 10 and 11 are analyzed and rejected as previously discussed with respect to claims 12-18, 21 and 22.

5. Claims 8, 9, 19 and 20 rejected under 35 U.S.C. 103(a) as being unpatentable over Ohyama et al. (US 5,864,364) in view of Handschy et al. (US 5,347,378) as applied to claims 1 and 12 above, and further in view of Yamada (US 6,256,067).

[claim 19]

Regarding claim 19, Yamada discloses a camera with a light source system comprising multiple light sources each of which corresponds to a different spectral power distribution (i.e. color; c. 8, ll. 1-14). By modulating the illumination light, the camera of Yamada is able to take pictures in which only the subject appears, the subject is enhanced relative to the background or a desired hue characteristic can be enhanced or diminished (c. 14, ll. 37-47). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the system of Yamada in the camera of Ohyama in view of Handschy to be able to take pictures in which only the subject appears, the subject is enhanced relative to the background or a desired hue characteristic can be enhanced or diminished.

[claim 20]

Regarding claim 20, see claim 19.

[claims 8 and 9]

Art Unit: 2612

Claims 8 and 9 are method claims corresponding to apparatus claims 19 and 20. Therefore, claims 8 and 9 are analyzed and rejected as previously discussed with respect to claims 19 and 20.

6. Claims rejected under 35 U.S.C. 103(a) as being unpatentable over Ohyama et al. (US 5,864,364) in view of Shibazaki (US 5,748,236).

[claim 44]

Regarding claim 44, Ohyama discloses an apparatus for multi-spectral image capture comprising: one image acquisition system having two or more color channels (Figure 4), each of the channels having a different spectral sensitivity (Figure 7A). Ohyama further discloses the use of a color filter wheel to create multi-spectral images (Figure 4, Item 2), but does not disclose a set of two or more illuminants, where each illuminant has a different spectral power distribution and illuminating one of the images of the first scene.

Shibazaki discloses a camera in which a color filter wheel for creating individual images of different colors is replaced by a set of illuminants (Figure 12), where each of the illuminants has a different spectral power distribution (c. 15, ll. 4-18). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the color filter wheel of Ohyama with the set of illuminants disclosed by Shibazaki to remove the complexity of synchronizing the rotating of a color wheel with the multi-spectral image capture operation.

[claim 45]

Regarding claim 45, Ohyama discloses a spectral image processing system which generates a multi-spectral scene description from the acquired first series of filtered images (c. 10, ll. 41-51).

[claim 46]

Regarding claim 46, Ohyama disclose an image acquisition system which acquires a second series of images of a second scene and the set of color filters filter each of the second series of images of the second scene with a different filter (c. 9, ll. 5-11).

[claim 47]

Regarding claim 47, Ohyama discloses generating a characteristic mapping from the second series of filtered images (c. 11, ll. 12-37; Figure 13, " $L(\lambda)$ ").

[claim 48]

Regarding claim 48, Ohyama discloses generating a spectral reflectance (Figure 13, " $S(\lambda)$ ") of the first scene from the multi-spectral scene description (Figure 13, " $S(\lambda)L(\lambda)$ ") and the characteristic mapping (Figure 13, " $L(\lambda)$ ").

[claim 49]

Regarding claim 49, Ohyama discloses a reproduction device to display the first scene based on the spectral reflectance (e.g. Figure 1, "REPRODUCTION SIDE"), but does not disclose a printing device to do so. Official Notice is taken that it is notoriously well known to print images using printing devices so as to create a hard copy of the image. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a printing device on the reproduction side of

Art Unit: 2612

Ohyama in view of Shibazaki to create hard copies of the reproduced first scene.

[claim 50]

Regarding claim 50, Ohyama does not explicitly disclose a memory device for storing the generated spectral reflectance for the first scene. However, it is noted that this value is created in a divider (Figure 13, Item 352) and then sent to an adder (Figure 13, Item 353). It is noted that the spectral reflectance must inherently be stored after its creation so that it may be used for further processing (i.e. by the adder) in the arithmetic unit of Ohyama.

[claims 37-43]

Claims 37-43 are method claims corresponding to apparatus claims 44-50. Therefore, claims 37-43 are analyzed and rejected as previously discussed with respect to claims 44-50.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following further shows the current state of the art in image capture systems with filter substitution:

i. Ikeda et al. US 6,100,929

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J Henn whose telephone number is (703) 305-

Art Unit: 2612

8327 or (571) 272-7310 after 28 February 2005. The examiner can normally be reached on M-F 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy R Garber can be reached on (703) 305-4929. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TJH
1/21/2005



TUAN HO
PRIMARY EXAMINER